



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,875	03/22/2004	Alexander I. Yatskov	021944.116US	9876
26720 7590 03/03/2008 LOCKE LORD BISSELL & LIDDELL LLP ATTN: IP DOCKETING 600 TRAVIS STREET 3400 CHASE TOWER HOUSTON, TX 77002				
EXAMINER				
PAPE, ZACHARY				
ART UNIT		PAPER NUMBER		
2835				
MAIL DATE		DELIVERY MODE		
03/03/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/805,875

Applicant(s)

YATSKOV ET AL.

Examiner

ZACHARY M. PAPE

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 4, 7-13, 19, 22-24, 26-29, 31-43, 51-54, 57-61 and 72 is/are pending in the application.
- 4a) Of the above claim(s) 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 7-13, 19, 22-24, 26-29, 32-34, 36-43, 51-54, 57-61 and 72 is/are rejected.
- 7) ☒ Claim(s) 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/10/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The following detailed action is in response to the correspondence filed 12/10/2007.

Information Disclosure Statement

1. The Information Disclosure Statement filed on 1/10/2008 has been considered and is attached hereto. The references with respect to DE 19804901, DE 29908370 G. Klinberg, have not been considered since they are not accompanied by a concise explanation of the relevance and a written English translation (at least a portion thereof). Additionally, the Examiner notes that only the first page of DE 19804901 has been supplied to the office.

Claim Objections

2. Claims 26 and 72 are objected to because of the following informalities:
Claim 26 recites, "the second heat exchanger" which lacks antecedent basis.
Claim 72 recites (twice), "disposed the chassis" which is incorrect/
Appropriate correction is required.

Claim Rejections - 35 USC § 102

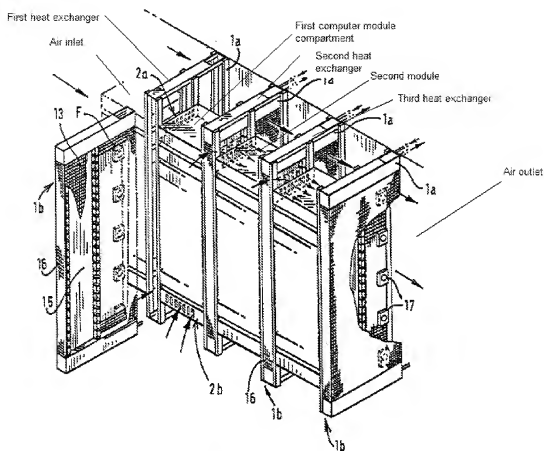
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

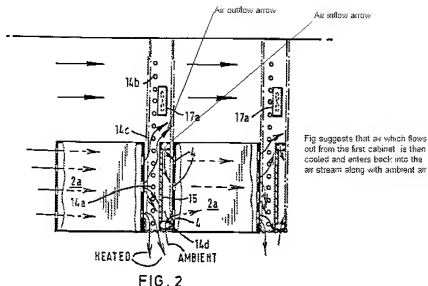
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3,4,7,12,13,19,26,28,29,32,33,36-43,57,60,61 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller et al. (US 6,305,180 – hereinafter, “Miller”).

With respect to claim 1, Miller teaches a computer system comprising: a chassis (Generally depicted in Fig 2a) having an air inlet and an air outlet; an air mover (6) disposed within the chassis and associated with either the air inlet or the air outlet and establishing a forced air flow path within the chassis; a first computer module compartment (Between respective element 1b) positioned in the chassis and in the forced air flow path so that heat from the first compartment may be transferred to the forced air flow; a first air-to-fluid heat exchanger (1b) having a plurality of heat transfer surfaces (Pipes as in Fig 2b) therein, and positioned in the chassis between the air inlet (adjacent the first heat exchanger 1b) and the first compartment in the forced air flow path such that the forced air flows through the heat exchanger and across the heat transfer surfaces and thereby removes a portion of the heat from the air (See Fig 2c which shows cooled air entering the flow path after the first exchanger); a second computer module compartment (Between respective element 1b) positioned in the chassis and in the forced air flow path; a second air-to-fluid heat exchanger (1b) having a plurality of heat transfer surfaces (Pipes, Column 9, Lines 13-19) therein, and positioned in the chassis between the first and second compartments in the forced air flow path such that the forced air flows through the second heat exchanger and across the heat transfer surfaces and thereby removes a portion of the heat from the air (See Fig 2a, see also Column 9, Lines 13-33; also see POA Figs 1 and 2 below).





With respect to claim 26, Miller further teaches (In Figs 2a and 5) a computer system comprising: a chassis (Generally depicted in Fig 2a); an air mover (6, 17a) coupled to the chassis to induce a flow of air along a flow path within the chassis; a first computer module compartment (Adjacent 1b) positioned in the chassis and in the air flow path; a first air-to-fluid heat exchanger (1b) positioned in the chassis and in the air flow path, wherein the first heat exchanger includes at least one internal fluid passage (Pipes, P) configured to carry a working fluid that absorbs heat from in the air flow path; and a heat exchanger (43) positioned external to and spaced apart from the chassis (See Fig 5 which suggests that the heat exchanger (43) is separate and apart from the chassis) and in fluid communication with the first heat exchanger, wherein the second heat exchanger is configured to cool the working fluid (Col 10, Lines 33-54).

With respect to claims 3 and 41, Miller further teaches that each heat exchanger (1b) includes at least one internal fluid passage (Pipes, P) configured to carry a working fluid.

With respect to claims 4 and 42, Miller further teaches that each heat exchanger (1b) includes at least one internal fluid passage (Pipes, P) configured to carry a working fluid having a boiling point in the heat exchanger between about 45° F. and about 75° F (Column 10, Lines 59-63).

With respect to claim 7, Miller further teaches a third computer module compartment (Where another of 2a is placed) positioned in the chassis and in the air flow path; and a third heat exchanger (Another of 1b) positioned in the chassis and in the air flow path, wherein the third heat exchanger is positioned at least partially downstream of the second computer module compartment and at least partially upstream of the third computer module compartment (See Fig 2a).

With respect to claims 28, and 32, Miller further teaches that the first computer module compartment (Between respective 1b) is configured to hold a plurality of computer modules (2a) oriented edgewise with respect to the air flow path (See Fig 2a).

With respect to claims 12, 29, 39, Miller further teaches that the first computer module compartment is configured to hold at least a first computer module oriented edgewise with respect to the air flow path toward a first side of the second heat exchanger, and wherein the second computer module compartment is configured to hold at least a second computer module oriented edgewise with respect to the air flow path from a second side of the second heat exchanger opposite to the first side of the second heat exchanger (See Fig 2a).

With respect to claims 13 and 43, Miller further teaches a first computer module (2a) carried by the first computer module compartment, wherein the first computer

module includes at least a first computer processor (Column 8, Lines 28-31, "components"); and a second computer module (Another of 2a) carried by the second computer module compartment, wherein the second computer module includes at least a second computer processor (Column 8, Lines 28-31, "components").

With respect to claim 19, Miller further teaches that the heat exchanger (1b) is a first heat exchanger, and wherein the computer system further comprises: a third computer module compartment (Between respective element 1b) positioned in the air flow path in the chassis; and a third heat exchanger (1b) positioned at least partially between the second and third computer module compartments in the air flow path in the chassis, the second heat exchanger (1b) including at least one internal fluid passage (Pipes, P) configured to carry a working fluid having a boiling point in the second heat exchanger between about 45° (Column 10, Lines 59-63).

With respect to claim 33, Miller further teaches that the chassis has an air inlet and an air outlet (See POA Fig 1 above); a first plurality of computer modules (2a) held in the first computer module compartment at least partially in the air flow path; a second computer module compartment (Between respective element 1b) positioned in the air flow path in the chassis and spaced apart from the first computer module compartment; a second plurality of computer modules (2a) held in the second computer module compartment at least partially in the air flow path; and a second air-to-fluid heat exchanger (1b) positioned in the air flow path in the chassis, wherein the second heat exchanger is positioned at least partially downstream of the first computer module compartment and at least partially upstream of the second computer module

Art Unit: 2835

compartment, and wherein the second heat exchanger includes at least one opening (13) through which the air mover moves air to transfer heat from the air to the fluid (Column 9, Lines 13-33, see also POA Fig 2 above).

With respect to claim 36, Miller further teaches that the air mover (17a) is carried by the chassis (See Figs 2a, where the heat exchanger (1b) carries 17a which in turn is carried by the chassis).

With respect to claim 37, Miller further teaches a third computer module compartment (Between respective element 1b) positioned in the air flow path in the chassis and spaced apart from the second computer module compartment; a third plurality of computer modules (2a) held in the third computer module compartment at least partially in the air flow path; and a third heat exchanger (1b) positioned in the air flow path in the chassis, wherein the third heat exchanger is positioned at least partially downstream of the second computer module compartment and at least partially upstream of the third computer module compartment, and wherein the third heat exchanger includes at least one opening (13) through which the air mover moves air (See Fig 2a).

With respect to claim 38, Miller further teaches that the computer module compartments (That which 2a resides), and the heat exchangers (1b) are arranged vertically with respect to the chassis (See Fig 2a).

With respect to claim 40, Miller further teaches that each of the first plurality of computer modules (2a) is individually carried by the first computer module compartment (Fig 2a), wherein each of the first plurality of computer modules includes at least a first

computer processor (Column 8, Lines 28-31 – “components”), wherein each of the second plurality of computer modules (2a) is individually carried by the second computer module compartment (Fig 2a), and wherein each of the second plurality of computer modules includes at least a second computer processor (Column 8, Lines 28-31 – “components”).

With respect to claim 57, Miller further teaches a method for dissipating heat generated in a chassis (Generally depicted in Fig 2a), comprising: providing a chassis having an air inlet (See POA Fig 1 above), an air outlet (See POA Fig 1 above) and at least one heat-generating object (2a) therein; placing an air-to-fluid heat exchanger (1b) in the chassis; moving a working fluid through an internal passage (Pipes, P) of the heat exchanger; moving air (Via 6) through the air inlet and through the heat exchanger to transfer heat from the air to the working fluid; controlling the working fluid (Via 50) to maintain the working fluid at least proximate to the phase transition state while flowing through the internal passage (Where 50 can reduce liquid flow such that the working fluid remains proximate to the phase transition state); and moving at least a portion of the cooled air across the heat generating object (2a) to transfer heat to the air (See POA Fig 1 above).

With respect to claim 60, Miller further teaches that the heat generating object is a first computer module, and wherein the method further comprises, after moving the portion of air across the computer module, moving the portion of air past a second heat exchanger (another of 1b) in the chassis to transfer heat from the portion of air (See POA Fig 1 above).

With respect to claim 61, Miller further teaches that controlling the working fluid to maintain the working fluid at least proximate to the phase transition state includes controlling the pressure of the working fluid (Where 50, a pump, controls the working fluid and the pump controls the pressure of the working fluid)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-11, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller.

With respect to claims 8 and 9, Miller teaches the limitations of claim 1 as per above but is silent as to the airflow path and arrangement of the heat exchangers/computer module compartments being substantially vertical/arranged vertically one on top of the other. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to re-arrange the heat exchangers and computer compartments as in Fig 2a (essentially rotate the invention in Fig 2a 90 degrees counter-clockwise) since it has been held that rearranging parts of an invention involves only routine skill in the art, In re Japikse, 86 USPQ 70.

With respect to claim 10, Miller further teaches that the first computer module compartment (Between respective 1b) is configured to hold at least a first computer module (2a) oriented edgewise with respect to the air flow path (See Fig 2a).

With respect to claim 11, Miller further teaches that the first computer module compartment (Between respective 1b) is configured to hold a plurality of computer modules (2a) oriented edgewise with respect to the air flow path (See Fig 2a).

With respect to claim 34, Miller teaches the limitations of claim 33 above and further teaches that the air movers move air horizontally through the chassis but is silent as to the vertical configuration of the chassis with the air mover being positioned toward the top of the chassis to move air up through the chassis, however it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the chassis 90 degrees such that the heat exchangers 1b are arranged vertically since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70. In the present case one would be motivated to arrange the chassis vertically such that it would fit within a room.

5. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Khrustalev et al. (US 2003/0010477 – hereinafter, “Khrustalev”).

With respect to claims 22-23, Miller teaches the limitations of claim 3 and further teaches that the working fluid is carried by the internal fluid passage (Pipes, P) of the heat exchangers, but fails to teach that the working fluid is a refrigerant where the first

Art Unit: 2835

portion of the working fluid is in a liquid state and a second portion of the working fluid is in a gaseous state in the heat exchangers. Khrustalev teaches a working fluid which is a refrigerant [0039] wherein a first portion of the working fluid is in a liquid state and a second portion of the working fluid is in a gaseous state (The working fluid will be both in a liquid and gaseous state in the heat exchanger since the heat from the board (9) is causing the fluid to change phases). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Khrustalev with that of Miller to provide an alternate equivalent medium for removing heat from the air. In the event that one of the pipes (P) were to break, a refrigerant will evaporate rather than spill onto the components and cause damage.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Khrustalev and further in view of Iizuka et al. (US 6,258,293 – hereinafter, “Iizuka”).

With respect to claim 24, Miller in view of Khrustalev teaches the limitations of claim 22 above but is silent as to the working fluid has a boiling point in the first heat exchanger between about 50F and about 65F. Iizuka teaches the conventionality of using a refrigerant having a boiling point between 50 and 65F (Column 11, Lines 10-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Iizuka with that of Miller to provide adequate heat transfer capabilities.

7. Claims 27, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Salt (US 5,603,375).

With respect to claim 27, Miller teaches the limitations of claim 26 above but is silent as to the working fluid has a boiling point in the first heat exchanger between about 45F and about 75F. Salt teaches utilizing a working fluid which has a boiling point in a heat exchanger of between about 45F and 75F (Column 2, Lines 1-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Salt with that of Miller to provide adequate heat transfer capabilities.

With respect to claim 58, Miller in view of James teaches the limitations of claim 57 as per above, however James is silent as to the working fluid having a boiling point between about 45 and 75F. Salt teaches utilizing a working fluid which has a boiling point in a heat exchanger of between about 45F and 75F (Column 2, Lines 1-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Salt with that of Miller to provide adequate heat transfer capabilities.

8. Claim 51, 54 and 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of James et al. (US 4,756,164, hereinafter, "James").

With respect to claims 51, 54 and 72, the method steps recited in the claims are inherently necessitated by the device structure as taught by the Miller reference in claim

1 above, further, Miller teaches (In Fig 5) the conventionality of having a heat exchanger (43) which is spaced apart from the chassis (adjacent P). Miller however teaches using a coolant type system to remove heat from the chassis and therefore is silent as to using a refrigerant which boils in the heat exchangers. James teaches a heat exchanger which has a refrigerant that boils to remove heat from a system (Column 4, Lines 12-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of James with that of Miller to provide an alternate equivalent means of transferring heat from a device. In the event that one of the pipes (P) were to break, a refrigerant will evaporate rather than spill onto the components and cause damage.

9. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of James and further in view of Salt.

With respect to claim 52, Miller in view of James teaches the limitations of claim 51 as per above, however James is silent as to the working fluid having a boiling point between about 45 and 75F. Salt teaches utilizing a working fluid which has a boiling point in a heat exchanger of between about 45F and 75F (Column 2, Lines 1-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Salt with that of Miller to provide adequate heat transfer capabilities.

10. Claims 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of James and further in view of Iizuka et al. (US 6,258,293 – hereinafter, “Iizuka”).

With respect to claim 53, Miller in view of James teaches the limitations of claims 51 and 57 above but is silent as to the working fluid has a boiling point in the first heat exchanger between about 50F and about 65F. Iizuka teaches the conventionality of using a refrigerant having a boiling point between 50 and 65F (Column 11, Lines 10-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Iizuka with that of Miller and James to provide adequate heat transfer capabilities.

11. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Iizuka.

With respect to claim 59, Miller teaches the limitations of claim 57 as per above but is silent as to the working fluid has a boiling point in the first heat exchanger between about 50F and about 65F. Iizuka teaches the conventionality of using a refrigerant having a boiling point between 50 and 65F (Column 11, Lines 10-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Iizuka with that of Miller and James to provide adequate heat transfer capabilities.

Allowable Subject Matter

12. Claim 31 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

See the office action dated 6/8/2007.

Response to Arguments

13. Applicant's arguments with respect to the presently pending claims have been considered but are moot in view of the new ground(s) of rejection.

With respect to claim 26 and 51, the Examiner has issued a new grounds of rejection for each claim and therefore the present action is non-final.

The Examiner acknowledges the Applicants' remarks with respect to application 11/164,187 and US 3,317,798. The Examiner thanks the Applicant's for their full disclosure.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZACHARY M. PAPE whose telephone number is (571)272-2201. The examiner can normally be reached on Mon. - Thur. (7:00am - 5:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on 571-272-3740. The fax phone

Art Unit: 2835

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Z. M. P./
Examiner, Art Unit 2835

/Jayprakash N Gandhi/
Supervisory Patent Examiner, Art Unit 2835